2/2   014   UNCLASSIFIED   PROCESSING DATE--09OCT70
CIRC ACCESSION NO--AP0108926
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SOLN. OF 0.6PERCENT ROGOR IN
  WATER SPRAYED ON APPLE TREES AT 500 1-HA REDUCED THE MOBILITY OF WATER
  IN THE LEAVES AND LESSENED THEIR TRANSPIRATION. AFTER SPRAYING, THE
  LEAVES APPEARED BURNED.

UNCLASSIFIED

Acc. Nr: AP0047191

Ref. Code: UR 0511

PRIMARY SOURCE: Stomatologiya, 1970, Vol 49, Nr 1 , pp 85-86

YE. S. Malevich, O. N. Malevich, L. V. Barudulina — THE EMPLOYMENT OF THE METHOD OF REGIONAL INTRA-ARTERIAL ANTINEOPLASTIC CHEMOTHERAPY IN STOMATOLOGICAL ONCOLOGY

S u m m a r y. The method of regional chemotherapy was used in 43 patients with tumors of the maxillofacial region. For the treatment of inoperable tumors of the face and jaws in a far-advanced stage, tumors refractory to radium therapy, metastases and relapses after surgical or radium treatment the authors used ThioTEP, endoxan and cyclophosphane. The most marked clinical effect was obtained in patients who were treated with ThioTEP and also in the treatment of tumors localized on the tongue, floor of the mouth and maxilla.

REEL/FRAME

19790690

USSR   UDC: 536.45:66.096.5

BORODULYA, V. A., Institute of Heat and Mass Exchange, Academy of Sciences
Byelorussian SSR

Vysokotemperaturnyye Protsessy v Elektrotermicheskom Kipyashchem Sloye (High-
Temperature Processes in an Electrothermal Fluidized Bed), Minsk, "Nauka i Tekhnika,"
1973, 176 pp

Translation: Study results are presented on the high-temperature endothermal
processes in an electrothermal fluidized layer. The schematics and construction
particulars of the utilized units are described. Data are given on the study of
the electrical properties of fluidized beds within a broad range of temperatures.
These data are necessary for the calculation and design of units. Heating and
diffusion particulars are studied under conditions of the contact of bodies with
an electrothermal fluidized bed. The number of scientific and engineering-tech-
nical workers in the chemical, metallurgical and other branches of industry is
calculated who are working on problems associated with the practical application
of the fluidized bed. The monograph contains: 30 tables, 48 illustrations, and
379 bibliographic entries.

Table of Contents

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BORODULYA, V. A., High-Temperature Processes in an Electrothermal Fluidized Bed, Minsk, 1973

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BORODULYA, V. A., High-Temperature Processes in an Electrothermal Fluidized Bed, Minsk, 1973

USSR

BORODULYA, V. A., High-Temperature Processes in an Electrothermal Fluidized Bed,
Minsk, 1973

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1/2   021   UNCLASSIFIED   PROCESSING DATE--16OCT70

TITLE--ELECTRIC CURRENT THROUGH A FLUIDIZED BED OF CONDUCTING PARTICLES
-U-

AUTHOR-(03)-ZHELTOV, A.I., ZABRODSKIY, S.S., BORODULYA, V.A.

COUNTRY OF INFO--USSR

SOURCE--INZHENERNO FIZIC HESKIY ZHURNAL, 1970, VOL 18, NR 1, PP 64-67

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ELECTRIC RESISTANCE, ELECTRIC CURRENT, FLUIDIZED BED,
GRAPHITE, PARTICLE PHYSICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1722   STEP NO--UR/0170/70/018/001/0064/0067

CIRC ACCESSION NO--AP0118700

UNCLASSIFIED

CIRC ACCESSION NO--AP0118700

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FIG. 1. SPECIFIC ELECTRIC
RESISTANCE (OHM CM) OF FLUIDIZED BED OF GRAPHITE PARTICLES 0.1-0.16 MM
VERSUS DENSITY OF CURRENT (A-CM PRIME2) WITH EXPANSION OF 1.2: 1,
ARGON, 20DEGREESC; 2, HELIUM, 2000DEGREESC; 3, ARGON, 2000DEGREESC.
FIG. 2. SCHEME OF EXPERIMENTAL INSTALLATION: 1, CHAMOTTE; 2,
ELECTRODES; 3, ALUMINUM OXIDE FILLING; 4, GAS DISTRIBUTOR; 5, FLUIDIZED
BED.   FIG. 3. COMPARISON OF RELATIONSHIPS P EQUALS F(I) FOR GRAPHITE
PARTICLES 0.16-0.2 MM IN DIA WITH EXPANSION 1.1 FOR RECTANGULAR (LIGHT)
AND CYLINDRICAL (DARK POINTS) INSTALLATIONS, RESPECTIVELY (P, OHM. CM;
I, A-CM PRIME2): 1, TEMPERATURE 20 DEGREESC; 2, TEMPERATURE 1000
DEGREESC.   FIG. 4. TEMPERATURE DEPENDENCE OF AMPLITUDE (PERCENT) OF
CURRENT FLUCTUATIONS FOR PARTICLES 0.16-0.2 MM IN DIA WITH EXPANSION
1.1: 1, RECTANGULAR INSTALLATION; 2, CYLINDRICAL INSTALLATION.   THE
DEPENDENCE OF SPECIFIC ELECTRIC RESISTANCE OF A FLUIDIZED BED OF
CONDUCTING PARTICLES ON CURRENT DENSITY IS STUDIED. ELECTRODYNAMIC
MECHANISM OF THE RELATIONSHIP S EQUALS F (I) IS DESCRIBED AND IT IS
SHOWN THAT WITH INCREASING TEMPERATURE THE AMPLITUDE AND FREQUENCY OF
ELECTRIC CURRENT FLUCTUATIONS DECREASE WHICH DEMONSTRATES LOWER
FREQUENCY OF GAS BUBBLE MOTION.

USSR   UDC 621.357.035(088.8)

BORODYANSKIY, A. M.

"Stand for Non-bath Galvanic Treatment of Apertures in Parts"

USSR Author's Certificate No 299568, Filed 31/07/69, Published 28/04/71,
(Translated from Referativnyy Zhurnal, Khimiya, No 2, 1972, Abstract No
2 L302 P from the Resume).

Translation: A stand for non-bath galvanic treatment of apertures in parts,
containing a primary tank with electrolyte, the upper portion of which in-
cludes a panel with clamps for installation of parts, differing in that in
order to increase the accuracy of change of the level of the electrolyte in
the apertures being worked, the stand is equipped with a moving, self-braking
additional tank connected by a hose with the main tank.

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USSR

B

UDC 621.373

BELOV, V. D., KORODYANSKIY, I. I., BUTYL'SKIY, YU. T.

"Synthesizer Decade with a Low Level of Spurious Products"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. Vyp. 3 (Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute. Vyp. 3), Leningrad, 1970, pp 205-209 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D267)

Translation: This article contains the results of an investigation of the possibility of realizing synthesizer decades based on a capacitive mixer and a counting frequency divider made of current switches with a ratio of the output signal to the stray product level on the order of 120 decibels. There are two illustrations, three tables and a five-entry bibliography.

1/1

TITLE--STUDYING THE RATE OF HARDENING OF BINDING MATERIALS USED FOR MAKING
   CORES IN HEATED RIGS -U-
AUTHOR-(03)-GERGALOVA, L.M., BORODYANSKIY, L.YE., ZLOBINSKIY, B.A.

COUNTRY OF INFO--USSR

SOURCE--KIEV, TEKHNOLOGIYA I ORGANIZATSIYA PROIZVODSTVA, NO 1, 1970, PP
   55-57
DATE PUBLISHED-------70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS

TOPIC TAGS--BIBLIOGRAPHY, FOUNDARY CORE, METAL CASTING, ADHESIVE BINDER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1320   STEP NO--UR/0418/70/000/001/0055/0057

CIRC ACCESSION NO--AP0123279
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0123279
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS STUDY THE RATE OF
HARDENING FOR BINDING MATERIALS AND GIVE RECOMMENDATIONS ON DETERMINING
THE USEFULNESS OF BINDS FOR PRACTICAL APPLICATION.

UNCLASSIFIED

USSR   UDC: 8.74

BORODYANSKIY, Yu. M., PROSKURINA, N. A., TSIKUNOV, I. K.

"A Dialog Language for Giving Expert Estimates"

Kiev, Mat. obespech. EVM dlya ekon. zadach--sbornik (Computer Software for Economics Problems--collection of works), 1972, pp 67-81 (from RZh--Kibernetika, No 7, Jul 73, abstract No 7V622 by V. Mikheyev)

Translation: The paper describes a version of an expert generalization language with an automated system for analysis of situations (ASAS). A specific feature of the language is its dialog nature. Data for the ASAS cannot be obtained in the form of one or more separate data batches, but are obtained rather as a result of a man-machine dialog. In this connection, each succeeding inquiry made by the ASAS to the expert depends not only on the information already present in the system before the dialog with the given expert, but also on the replies of the expert to preceding questions by the system formed by special programs. The proposed language enables the development and insertion of corrections during use. The language is formulated in the formalism of context-free languages with realization of the problem of data retranslation. From the

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USSR

BORODYANSKIY, Yu. M. et al., Mat. obespech. EVM dlya ekon zadach, 1972, pp 67-81

design standpoint the dialog language consists of two organically related parts: 1) language constructions which describe the object or situation to be analyzed, and which influence realization of the main situation, i. e. constructions for formal description of a very broad class of objects and concepts; 2) language constructions which set the scheme for carrying on the dialog. It is noted that development of formal construc- tions of the first type for actual objects and situations involves the following difficulties: a) such a formalization is possible only for a fairly foreseeable class of objects, and must be developed through pro- tracted work of the system with experts; b) it is assumed that the problem of semantic identification of syntactically different phrases of the lan- guage has been solved to some extent. In this connection it is suggested that the ASAS system be operated at first with an incomplete data lan- guage -- the dialog part in which only the most general syntactic limi- tations necessary for operation of the translator are imposed on the constructions describing the object of analysis. Questions relating to identification of different definitions of the same concept, unique in-

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USSR

BORODYANSKIY, Yu. M. et al., Mat. obespech. EVM dlya ekon. zadach, 1972, pp 67-81

terpretation of some concept, and the formation and extension of language constructions of the first type are solved during the initial operation of the system by the expert personnel responsible for operation of the ASAS. As experience in using the system is accumulated, it will become possible to concretize the syntax of phrase-descriptions and to change over to setting up a specialized expanding reference information system which will chiefly take over the functions listed above.

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USSR

UDC: 51

ONISHCHENKO, A. M., BORODYUK, V. M.

"Mathematical Economics Model of Optimization of the Complex Development
of Interrelated Sectors"

V. sb. Vopr. nauch. organiz. proiz-va v nar. kh-ve USSR (Problems of Scien-
tific Organization of Production in the National Economy of the Ukrainian
SSR--collection of works), vyp. 1, Kiev, 1970, pp 120-125 (from RZh-
-Kibernetika, No 4, Apr 72, Abstract No 4V512).

Translation: A multiple-index model with Boolean variables is written out
(on the basis of agricultural materials). Considerations are given on the
numerical solution of the model.

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USSR

PYATKIN, A. M., BORODYUK, V. M.

"Method of Combined Optimization of Development of Raw Material Bases and Processing Enterprises"

Mekhaniz. Ucheta i Vychisl. Rabot. Mezhved. Nauch. sb. [Mechanization of Accounting and Computer Operations, Interdepartmental Scientific Collection], No 13, 1971, pp 120-127, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V651, unsigned).

Translation: A model with Boolean variables is presented. The method of solution of the linear problem by a simplex method with subsequent rounding off is suggested for solution.

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USSR   UDC 629.78.018.1(088.8)

BOROG, V. A., SANKOV, Ye. I., ROKITYANSKIY, R. I., SOSUL'NIKOV, I. L.,
TSVETKOV, Ye. A.

"Installation for Creation of an Air Stream"

Translation: This invention relates to equipment for aerodynamic research,
namely installations for the creation of an air stream. Installations for
the creation of an air stream are known, containing a platform and a non-
moving cover installed on the platform, forming an air channel together with
an attached shaped nozzle fixed relative to it, in which there is a motor
with a fan and a guiding grid. These installations do not allow aerodynamic
loading of individual units of an assembled aircraft at various levels and at
an angle to its primary planes. The installation suggested for the creation
of an air stream differs from known installations in that the cover is fas-
tened to the platform by hydraulic lifters allowing it to be moved forward
and backward and rotated by a fixed angle in the vertical plane. Furthermore,
the end portion of the cover is made with guides which rotate the attached
nozzle around the axis of the air channel, while the device for fixation of
the nozzle relative to the cover is equipped with a hydraulic drive. 2 Figures.
1/1   - 125 -

USSR

BOROK, B. A., SHCHEGOLEVA, R. P., GOLUBEVA, L. S., OSTROVSKAYA, E. N.,
CHIKUNOV, M. I., and KUNIS, M. I., Central Scientific Research Institute of
Ferrous Metallurgy imeni I. P. Bardin

"Production Technology of Nickel-Base Brazing Alloys in Powder Form"

Abstract: The objective of the study was to develop an optimum production
technology for Ni-base alloys in powder form for brazing structures from
thin-sheet high-alloy steels. The test materials were powders of PKh12N75S8R-
grade Ni-Cr-Si-Fe-B brazing alloy and 6MA--a mixture of 85% of PKh12N75S8R
with 15% molybdenum. PKh12N75S8R was successfully used to braze 0Kh18N10,
1Kh18NT, and Kh25N16G7AR high-alloy steels. The brazing temperature was
1180°C and the secondary melting (unsoldering) temperature--1080°C. Addition
of molybdenum (15%) to Kh25N16G75S8R was found to raise the unsoldering
temperature by 130°C and ensure a joint tensile strength of 30 kg/mm^2.
(1 illustration, 7 tables, 6 bibliographic references)

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USSR   UDC 621.762.2:669.24

LAVRENT'YEV, I. A., SHCHEGOLEVA, R. P., BOROK, B. A., RYBAL'CHENKO, M. K.

"Problem of Using the Waste from Machining Alloys for Powder Metallurgy"

K voprosu ispol'zovaniya otkhodov mekhanicheskoy obrabotki splavov dlya tseley poroshkovoy metallurgii (Problem of Using the Waste from Machining Alloys for Powder Metallurgy), Metallurgy Institute of the USSR Academy of Sciences, Moscow, 1971, 21 pp, ill. 20-entry bibliography, No 3522-71 Dep. (from RZh--Metallurgiya, No 4, Apr 72, Abstract No 4G398 DEP)

Translation: Results are presented from the development of a technological process for obtaining KhN55VMTFKYu Ni-alloy powder from shavings -- production waste. The developed technological process was tested in the production of experimental lots of the powder. A study was made of the conditions of obtaining the sintered and deformed alloy and its mechanical properties at room temperature and higher temperatures. Five illustrations, 6 tables, and a 20-entry bibliography.

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USSR   UDC 621.785.661.65

KUZ'MICHEV, Yu. S., LUPAKOV, I. S., BOROK, B. A., and GAVRILOVA, V. K.,
Central Scientific Research Institute of Ferrous Metallurgy imeni I. P.
Bardin

"Investigation of the Effect of Boron on the Thermal Conductivity and Thermal
Expansion of Titanium"

Abstract: Results are presented of an investigation of the effect of boron
on thermal conductivity and linear expansion of titanium. The investigation
was carried out by the comparative method using samples containing 1, 2, 3, and
4 wt. % boron. Boron increased the thermal conductivity of titanium. The
thermal conductivity of titanium with boron, derived experimentally was some-
what higher than the rated one based on the heterogeneity of the alloy and
if it is considered that the alloy consists of a solid boron solution in
titanium and titanium diborides. The coefficient of linear expansion of
titanium decreased appreciably with the introduction of boron into it.

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1/2   011   UNCLASSIFIED   PROCESSING DATE--11SEP70
TITLE--REDUCING ORE TO SPONGE IRON WITH A HIGH CARBON IRON ALLOY -U-

AUTHOR--VOSKOBOYNIKOV, V.G., BOROK, B.A., TEPLENKO, V.G., SOLOVYEVA, Z.V.,
   KELTSEV, V.V.

COUNTRY OF INFO--USSR

SOURCE--BRIT. 1,181,207

DATE PUBLISHED--11FEB70

SUBJECT AREAS--MATERIALS, EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--CHEMICAL PATENT, IRON ORE, HIGH CARBON ALLOY, CHEMICAL
   REDUCTION, CARBON, SPONGE IRON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/0197   STEP NO--UK/0000/70/000/000/0000/0000

CIRC ACCESSION NO--AA0100721
                        UNCLASSIFIED

CIRC ACCESSION NO--AA0100721
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SPONGE IRON THAT IS MORE EASILY
   PULVERIZED THAN THE NORMAL SWEDISH PRODUCT, AND CAN BE PRODUCED MORE
   QUICKLY AND AT LOWER TEMP., IS OBTAINED BY HEATING 4.5 HR AT 1000DEGREES
   IN H A 40 MM THICK LAYER OF ORE CONCS. MIXED WITH SIMILAR TO ONE THIRD
   THEIR WT. OF AN FE-C ALLOY CONTG. 25-50PERCENT C TO PROVIDE SIMILAR TO
   9PERCENT C BY WT. IN THE MIXT.   THE ALLOY IS PRODUCED BY HEATING SPONGE
   FE LUMPS 15-25 MM IN SIZE IN NATURAL GAS AT 850-950DEGREES, WHICH IS
   THUS DECOMPD. AND CAN BE USED FOR THE ATM. NOTED ABOVE. THE ORE CONCS.
   FOR THIS PURPOSE SHOULD CONTAIN 70PERCENT FE AND BE FINER THAN 0.2 MM.
   THE SPONGE IRON PRODUCT CONTAINS 98PERCENT FE AND 0.05PERCENT C, AND IS
   EASILY PULVERIZED. THE YIELD-UNIT FURNACE VOL. IS 26PERCENT HIGHER WHEN
   THIS REDUCING AGENT IS USED INSTEAD OF COKE. NO SPECIAL APP. IS
   REQUIRED.

USSR

UDC 669 - 174'24

STEPANOVA, M. V., KORCLEV, F. V., ZOLOTUKHINA, A. M., FIGUROVSKAYA, T. A., BOROK, B. A., and SHCHEGOLEVA, R. P., Moscow Institute of Steel and Alloys of MZOTsM (Moscow Plant for the Processing of Non-Ferrous Metals), Central Scientific Research Institue of Ferrous Metallurgy

"The Effect of Alloying of Carbonyl Nickel on its Recrystallization"

Abstract: Carbonylnickel samples containing W, MgO, Al_2O_3, Zr, and ZrO_2 were cold-deformed with a terminal deformation of 70%. Recrystallization annealing was carried out at 160-600°C (20-degree intervals) with holding times at 30 min. The temperatures of the start and end of recrystallization I (t_r^s and t_r^e, respectively) were determined from the Vickers hardness as a function of annealing temperature, with an experimental error of $\pm 5°C$. The t_r^s and t_r^e of carbonyl nickel without any additivities were 330 and 400°C, respectively. These figures were 660 and 750°C with addition of 0.15% Zr; 500 and 730°C with 0.15% ZrO_2; 540 and 720°C with 4% W; 360 and 510°C with 0.2% MgO; and 400 and 540°C with 0.2% Al_2O_3, respectively. It is evident that the t_r^s increased by 330

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USSR

STEPANOVA, H. V., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, No 1, 1973, pp 150-152

and $210^{\circ}C$ with the addition of Zr and W, respectively. This can be attributed to a slow formation of the recrystallization centers because of the interaction of dislocations with Zr and W atoms. Due to the fact that the t_r^e

was increased from 400 to $750^{\circ}C$ when 0.15% Zr was added to carbonyl nickel, it is recommended that the intermediate annealing temperature increased from 600 to $750-800^{\circ}C$.

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USSR   UDC 517.946

BOROK, V. M., Khar'kov

"Classes of Uniqueness of Solution of Boundary-Value Problem in an Infinite
Layer for Systems of Linear Partial Differential Equations With Constant Co-
efficients"

Moscow, Matematicheskiy Sbornik, Novaya Seriya, Vol 79 (121), No 2(6), pp 293-304

Abstract; The article considers the system of equations

$$Lu \equiv \frac{\partial u(x,t)}{\partial t} - P\left(\frac{\partial}{\partial x}\right) u(x,t) = 0, \quad u = \{u_1, \ldots, u_n\}, \qquad (1)$$

$x \in R^m$, $0 \leqslant t \leqslant T$, $P \frac{\partial}{\partial x}$ is a matrix whose elements are polynomials of $\frac{\partial}{\partial x_1}$, ...,
$\frac{\partial}{\partial x_m}$ with complex coefficients. A solution is sought to equation (1) under boun-
dary conditions

$$u_{k_i}(x,0) = 0 \quad (1 \leqslant k_i \leqslant n; \ i = 1, \ldots, r; \ 1 \leqslant r \leqslant n-1),$$
$$u_{m_j}(x,T) = 0 \quad (1 \leqslant m_j \leqslant n, \ j = 1, \ldots n-r). \qquad (2)$$

The following question is considered: What assumptions about the increase of
function U(x,t), given $|x| = \left[\sum |x_i|^2\right]^{1/2} \longrightarrow \infty$,

guarantee that only the function $u(x,t) \equiv 0$ can be the solution of the problem
(1) -(2)? A similar question for a second-order equation (with respect to $\frac{\partial}{\partial t}$)

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USSR

for the scalar function $u(x,t)$ was solved by the author in an earlier article.
The determinant $\Delta(s)$ plays an important role in determining the classes of
uniqueness of the solution to the problem (1)-(2).

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USSR   ATO 021594   B   UR   0039
                                                    JPRS   49585

BOROK, V. M., Khar'kov

"Classes of Uniqueness of Solution of Boundary-Value Problem in an Infinite
Layer for Systems of Linear Partial Differential Equations With Constant Co-
efficients"

Moscow, Matematicheskiy Sbornik, Novaya Seriya, Vol 79 (121), No 2(6), pp 293-304

Abstract: The article considers the system of equations

$$Lu \equiv \frac{\partial u(x, t)}{\partial t} - P\left(\frac{\partial}{\partial x}\right)u(x, t) = 0, \quad u = (u_1, \ldots, u_n). \quad (1)$$

$x \in R^m$, $0 \leqslant t \leqslant T$, $P\frac{\partial}{\partial x}$ is a matrix whose elements are polynomials of $\frac{\partial}{\partial x_1}, \ldots,$
$\frac{\partial}{\partial x_m}$ with complex coefficients. A solution is sought to equation (1) under boun-
dary conditions

$$u_{k_i}(x, 0) = 0 \quad (1 \leqslant k_i \leqslant n; \; i = 1, \ldots, r; \; 1 \leqslant r \leqslant n-1).$$
$$u_{m_j}(x, T) = 0 \quad (1 \leqslant m_j \leqslant n, \; j = 1, \ldots n-r). \quad (2)$$

The following question is considered: What assumptions about the increase of
function $U(x,t)$, given $|x| = \left[\sum |x_i|^2\right]^{1/2} \longrightarrow \infty$,

guarantee that only the function $u(x,t) \equiv 0$ can be the solution of the problem
(1) -(2)? A similar question for a second-order equation (with respect to $\frac{\partial}{\partial t}$)

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AT0021594

for the scalar function $u(x,t)$ was solved by the author in an earlier article. The determinant $\Delta(s)$ plays an important role in determining the classes of uniqueness of the solution to the problem (1)-(2).

19621646

USSR

UDC: 616.22-008.4-789.28-78

PUPKO, I. D., ULASHKEVICH, Yu. V., MAGRACHEV, A. Z., BORONETS, V. P., DOLGOV, V. K., LAPSHIN, V. A., DEKHTYAR, B. S., VAYNSHTEYN, A. M.

"A Voice-Forming Device"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 28, 1970, Soviet Patent No 280548, Class 21, filed 9 Jun 69, p 42

Abstract: This Author's Certificate introduces a voice-forming device which contains a main current generator, projector and self-contained power supply. As a distinguishing feature of the patent, the sound spectrum of the projected oscillations is approximated to that of natural speech by adding a noise generator, a noise amplifier, and an operating mode commutator.

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Power

BORONIN, L. M., and ZHARKOVSKIY, Yu. V.

Translation: This item discusses USSR atomic electric power station (AES)
construction from 1971 through 1975. AES are able to compete economically
with TES [Thermal Electric Power Stations] which operate on costly imported
extractive fuels. Each newly operational AES reduces the overall reserve of
nuclear fuel (Uranium), as a consequence of which a more efficient utilization
of nuclear fuel has become one of the most important tasks of the atomic power
industry. 4 ill., 2 ref.

1/1

USSR

BORONIN, A. P., MEDVEDEV, YU. A., and STEPANOV, B. M., moscow

"Extended Electrical Pulse and the Dynamics of the Expansion of the Explosion Products of an Explosive Charge"

Abstract: The authors use statistical treatment to represent an entire set of pulses, which were obtained on the basis of a unified methodology which ensures small distortions in the studied time interval, in the form of a generalized dependence which describes the field pulses at various distances from the explosions of charges which are tens and hundred of grams in mass. It appears that the time dependence of the pulses is of self-similar nature and that the shape of the extended pulse contains particulars which correlate with the self-similar rule for the motion of explosion products. It follows that a low-frequency pulse is related to the products of explosion. Since existing materials on this problem, both theoretical and experimental, are not conclusive, the authors used optical observation of the expansion of the explosion products together with the registration of field pulses in that time interval where registration was comparatively simple.

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1/2   006   UNCLASSIFIED   PROCESSING DATE--02OCT70
TITLE--NEWS -U-

AUTHOR--BORONIN, V.

COUNTRY OF INFO--POLAND, USSR

SOURCE--VODNYY TRANSPORT, MARCH 31, 1970, P 4 COL 1

DATE PUBLISHED--31MAR70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--SURVEYING SHIP/(U)OKEAN SURVEYING SHIP, (U)PASSAT SURVEYING
  SHIP, (U)MUSSON SURVEYING SHIP, (U)VOLNA SURVEYING SHIP, (J)PRIBOY
  SURVEYING SHIP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0884   STEP NO--UR/9028/70/000/000/0004/0004

CIRC ACCESSION NO--AN0107413
                         UNCLASSIFIED

CIRC ACCESSION NO--AN0107413
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A NEW WEATHER SHIP, THE "OKEAN",
  HAS BEEN CONSTRUCTED ON ORDER OF THE SOVIET UNION IN POLAND. IT BELONGS
  TO THE SAME SERIES OF SHIPS AS THE "PASSAT", THE "MUSSON", THE "VOLNA",
  AND THE "PRIBOY".

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UNCLASSIFIED

USSR   UDC 535.376

BORODIN, YU.P., BORONIN, V.G., KAREV, YU.A., KRUGLOV, I.I., MIKHAYLOV, L.I.,
PAVLOVA, V.A., PETROV, V.S., RYZHIKOV, I.V.

"Study Of The Region Of Radiative Recombination In Electroluminescent
Structures Based On Diffusion And Epitaxial Specimens Of Gallium Arsenide"

V sb. Elektrolyuminestsentsiya tverd. tel. (Electroluminescence Of Solid Bodies--
Collection Of Works), Kiev, "Nauk.dumka," 1971, pp 54-58 (from RZh--Elektronika
i yeye primeneniye, No 11, Nov 1971, Abstract No 11B363)

Translation: A comprehensive study is presented of the electrical and optical
properties of the region of radiation recombination in diffused and epitaxial
specimens. The distribution is obtained of the impurity in the p-region of
diffused and epitaxial specimens by means of a measurement of the photolumin-
escent spectra. The experimentally determined transition time is: up to 1000
nanosecond with epitaxial specimens and 50 nanosec with diffused. The external
quantum efficiency at T =300° K of the diffused and epitaxial specimens equals
one percent and five percent, respectively, and for a construction with the
maximum possible external quantum efficiency $\sim$9 percent. 6 ill. 5 ref.Summary.

1/1

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USSR

UDC 532.517.4

BORONIN, V. V., ALEKSANDROV, M. A., MIROSHNICHENKO, G. V., SHENIN, Ye. K.

"Study of the Structure of Turbulence With the Aid of the 'Dnepr-1' Controlling Computer"

Translation: The results of a computer assisted automated calculation of the physical characteristics of the turbulence field with direct recording of measurements into the ready access memory of the computer are presented. Using transducers based on measuring the force action of the flow on the receiving element mechanically connected to the tensometric converter, the flow of water into a hydraulic chute with a working area of 160×160 mm was investigated. The frequency of interrogation of the transducers was 100 Hz and the time for carrying out the process was 20 sec. The distributions of the average velocity, the intensities of the pulsations in the flow rate and pressures and certain correlation functions are given for the range of Reynolds numbers $10-50 \cdot 10^3$. The effect of measurement time on the values measured was investigated. The results are similar to results of other investigators. 7 ref. V. A. Frost.
1/1

- 136 -

USSR   UDC· 621.373.826:550.3

AYUREAHAYN, A. A, BORONOYEV, V. V., and ZUBRITSKIY, E. V.

"Experimental Investigation of the Dispersion of Intensity Fluctu-
ations in Laser Radiation Under the Condition of Inclined Range
Length"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl.
(Tenth All-Union Conference on the Propagation of Radio Waves;
Report Theses--collection of works) "Nauka," 1972, pp 211-215 (from
RZh--Radiotekhnika, No 10, 1972, Abstract No 10D443)

Translation: Results are given of measurements of the dependence of
experimental dispersion values of the fluctuation in the light in-
tensity logarithm σ_e on the dispersion value d computed for a
given inclination of the range. The region of maximum values of
σ_e lies in the limits of $\sigma_1 = 1-3$, and saturation is reached at
$\sigma_e \simeq 1.2$. Two illustrations, bibliography of four. A. L.

1/1

USSR

BORONTSOV, L. A., SHILEYKO, A. V.

"Estimate of Information Productivity of a Digital Model"

Analogovaya i Analogo-Tsifr. Vychisl. Tekhn. [Analog and Analog-Digital Computer Equipment -- Collection of Works], No 5, Moscow, Sov. Radio Press, 1973, pp 86-91 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V617, by the authors).

Translation: The definition of information productivity of a digital model is a component part of the general problem of selection of the best structure. This article studies methods of estimation of the information productivity of a digital model from the standpoint of the theory of ε entropy of sets. Using the estimates produced, algorithm quality criteria are introduced, on the basis of which an algorithm which can be selected which is optimal in the sense of this criterion.

1/1

USSR

AVERKIN, A. A., BOROV, Yu. G., IVANOV, G. A., and REGEL', A. R.

"Effect of Pressure on the Electrical Properties of Bismuth"

Leningrad, Fizika Tverdogo Tela, Vol 13, No 2, February 1971, pp 378-380

Abstract: The effect of hydrostatic pressure up to 15 kilobars on the electrical conductivity, Hall effect, reluctance, and thermal emf of single crystals of pure bismuth (99.999%) at room temperature is investigated in this article. The band model of bismuth is used to calculate the variation in concentration and mobility of the current carriers as a function of pressure. Experimental and calculated results are presented graphically. They show that the concentration of the carriers drops by 40-45% at a pressure of 13 kilobars. A small increase in electron mobility and anomalous increase in hole mobility are also detected. It is shown that the band model of bismuth correctly depicts the conduction band, and the occurrence of a new mobile group of holes is possible for the valence band.

1/1

Acc. Nr:
AP0034076

Abstracting Service:
CHEMICAL ABST.   4-70

Ref. Code:
UR 0078

71201p Solubility of calcium tungstate in aqueous solutions of potassium sulfate at high temperatures and pressures.   Ra-vich, M. I.; Borovaya, F. E. (Inst. Obshch. Neorg. Khim. im. Kurnakova, Moscow, USSR). Zh. Neorg. Khim. 1970, 15(1), 151-5 (Russ).   Soly. of CaWO₄ in K₂SO₄ solns. was detd. at 500, 448, and 397° and 1300–2300 kg/cm² and the results are tabu-lated.   CaWO₄ dissolves congruently.   Its soly. increases mark-edly with K₂SO₄ concn. and has pos. temp. coeff.   Effect of pressure on soly. of CaWO₄ is related to the phase compn. of the solvent (K₂SO₄-H₂O).
HMJR

REEL/FRAME
19710719

USSR

BOROVICH, B. L., ZUYEV, V. S., KROKHIN, O. N. (Lebedev Physics Institute, USSR Academy of Sciences)

"Photochemical Dissociation Waves"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, April 1973, pp 1184-1189

Abstract: Photochemical dissociation waves in an absorbing molecular gas are studied on the basis of the solution of the transfer functions of the radiation and balance of the number of particles. The analysis is carried out for light of arbitrary spectral composition and any directivity and by taking into account the real molecular absorption bands. The analytic expressions obtained allow one to evaluate the velocity and width of the waves and the effective frequency band used for various shapes of the absorption bands. The possibility of stationary propagation of photochemical dissociation is investigated. Conditions for the appearance of inverse population of levels when one of the photodissociation products is in the excited state are analyzed. It is shown that the conditions for inversion differ qualitatively in the regions of fixed and stationary wave propagation.
1/1

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USSR

BOROVICH, B. L., ZUYEV, V. S., KATULIN, V. A., NOSACH, O. Yu.,
TYURIN, Ye. L., SHCHEGLOV, V. A.

"Concerning Propagation of a Light Pulse in a Moving Two-Level
Absorbing Medium"

Abstract: A solution is found for equations of propagation of
a monochromatic pulse with arbitrary time dependence $I_0(t)$
through a two-level absorbent medium with density of active
particles $N_0 = $ const and velocity $v(t)$. It is found that depend-
ing on the ratio of v and $v_0 = 2I_0/N_0$, there are two modes of
wave propagation with interface at $v = v_0$. The analysis is also
applicable to a source of emission moving with an arbitrary
velocity in the medium. Bibliography of six titles.

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USSR

UDC 621.375.82

BOROVICH, B. L., ŽUYEV, V. S., KATULIN, V. A., NOSACH, O. Yu., TYURIN, Ye. L., SHCHEGLOV, V. A.

"On the Propagation of a Light Pulse in a Moving, Two-Level Absorption Medium"

V sb. _Kvant. elektronika_ (Quantum Electronics -- Collection of Works), No. 2, Moscow, "Sov. radio", 1972, pp 88-89 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D845)

Translation: A solution is obtained for the transfer equations for a monochromatic pulse of radiation of an arbitrary time form $I_0(t)$ in a two-level absorption medium with a density of active particles N_0 = const and a velocity $v(t)$. It is shown that, depending on the relationships v and $v_0 = 2I_0/N_0$, there exist two modes of propagation of illumination waves with the interface at $v = v_0$. The study is also applicable for a radiation source moving with an arbitrary velocity in the medium. 6 ref. Authors abstract.

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1/2   040   UNCLASSIFIED   PROCESSING DATE--20NOV70
TITLE--ON THE POSSIBILITY OF EMPLOYING OPTICAL PUMPING FOR EXCITATION OF
   NOBLE GAS ATOMS -U-
AUTHOR-(02)-BURGVICH, B.L., ZLYEV, V.S.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
   NR 5, PP 1794-1797
DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--OPTIC PUMPING, POPULATION INVERSION, COLLISION, PHOTON, ATOM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/0022   STEP NO--UR/0056/70/058/005/1794/1797

CIRC ACCESSION NO--AP0127672
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0127672
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOR CREATION OF INVERSE POPULATION
  IN THE LEVELS OF NOBLE GAS MOLECULES (XE SUB2, KR SUB2 ETC.) IT IS
  SUGGESTED THAT AN OPTICAL EXCITATION METHOD BE APPLIED IN WHICH USE IS
  MADE OF THE TRANSITIONS WHICH OCCUR IN TRIPLE COLLISIONS BETWEEN A PHOTO
  AND TWO UNEXCITED ATOMS. THE PARAMETERS OF THE PUMPING SOURCE REQUIRED
  FOR APPRECIABLE AMPLIFICATION ARE ESTIMATED.   FACILITY:
  FIZICHESKIY INSTITUT IM. P. N. LEBEDEVA, AN SSSR.

UNCLASSIFIED

USSR

UDC: None

BAR'YAKHTAR, V. G., BOROVIK, A. Ye., and POPOV, V. A.

"Theory of the Intermediate State of Antiferromagnetic Objects"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, vol 62, No 6, 1972, pp 2233-2242

Abstract: The theory of the intermediate state of antiferromagnetics in an external field is given in this article. Beginning their analysis with an expression for the various phases that can occur in antiferromagnetics, depending on the direction and magnitude of the external magnetic field, the authors develop a theory of perturbations through which the magnetic moment distribution in the intermediate state can be found with any degree of accuracy. Results of the theory for the case in which the antiferromagnetics has the form of an ellipsoid are given under the assumption that the magnetic moment and antiferromagnetism vectors are in uniform distribution. Also considered is the nonuniform distribution of these vectors in a plate, where the free antiferromagnetic energy is varied with respect to the vectors. Expressions are obtained for the energy of the intermediate state and for the domain dimensions. The authors thank A. I. Akhiyezer and V. V. Yeremenko for their comments; they are associated with the Physico-Technical Institute for Low Temperatures, Ukrainian Academy of Sciences.

1/1

USSR

BAR'YAKHTAR, V. G., BOROVIK, A. YE., POPOV, V. A., and STEFANOVSKIY, YE. P., Physicochemical Institute of the Academy of Sciences Ukrainian SSR

"The Domain Structure of an Antiferromagnet Resulting From Variations in the Character of the Magnetic Anisotropy"

Abstract: The article considers the case of the phase transition (with respect to temperature) of the first kind $\phi_{\parallel} \rightleftarrows \phi_{\perp}$. Distributions are obtained for antiferromagnet sublattice magnetic moments at the interfaces of phases $\phi_{\parallel}$ and $\phi_{\perp}$ (90° boundary), as well as 180° domain boundaries in antiferromagnets with weak ferromagnetism. The surface energies of the 90 and 180° domain walls are calculated, and the domain structures for a plane-parallel plate are determined and domain sizes estimated. It is shown that a thermo-

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USSR

dynamically stable domain structure may occur in the phase transition
due to weak ferromagnetism of the phase with magnetic anisotropy of
the "easy plane" type. The surface energy of the 90° domain bound-
ary is significantly less than that of the 180° domain boundary.
However, the surface energy of the 180° interface declines signifi-
cantly as the phase transition temperature is approached and becomes
on the order of the 90° interface.

2/2

BOROVIK   N. A.

AA0052677

UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, /-70

241301   TRENCH FILLER has a working member comprising a frame 1 with closed scraping chain 3 placed in a vertical plane. It is distinguished by mounting, in the horizontal plane additional closed scraping chain 2 to, This achieves preloosening of the soil.

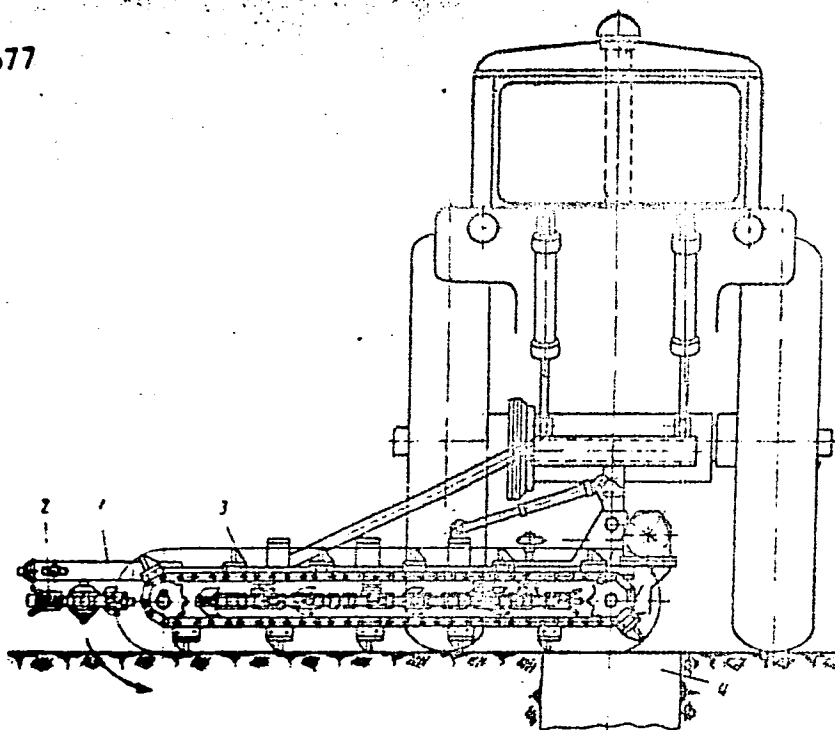12.2.66. as 1055097/29-16, POLTATEEV, I.S. et al. Kiev Binding Inst. (15.8.69) Bul. 13/1.4.69 Class 84d, Int. Cl. E 02f.

1/3

19821444

AA0052677

19821445

AA0052677

Poltavtsev, I. S.; Smryagin, A. G.; Protsenko, V. V.; Shvedov, V. Ye.;
Zgurskaya, L. M.; Lekhovich, I. F.; Rutberg, Ye. I.; Borovik, N. A.;
Kiyevskiy Filial Tsentral'nogo Nauchno-Issledovatel'skiy Instituta
Svyazi

3/3   19821446

BOROVIK   S. A.

AA0101179

UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General,
Derwent, /-70

242606 PLUNGER e.g. for fuel pump with spherical
head, carrying a footstep bearing in the
neck of which is a bracing ring, differing in the
bearing having a shoulder to which is fastened a
horseshoe-shaped frame of plastic to hold the ring.
The ring and shoulder may have shaped slots for
the frame to be pressed in . This gives a more
reliable fixing of the footstep bearing. Footstep
bearing 1 is connected to plunger 2 by bracing ring
3, fixed by frame 4. The material of the wall of
the frame is crimped around shoulder 5 on the foot-
step bearing and pressed into slots 6 and 7 on the
endface surface of ring 3 and shoulder 5.
2.1.68 as 1207319/24-6.POLIANSKII A.F.et al.(10.9.69)
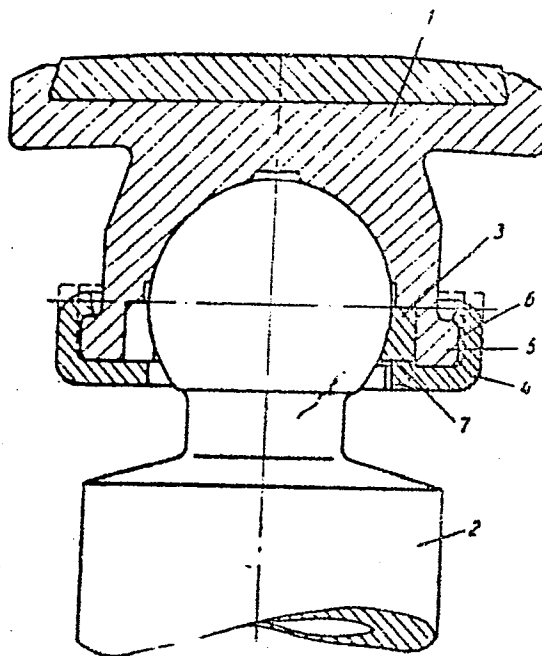Bul 15/25.4.69. Class 46f, 59a. Int.Cl.F 02c, F 05b.

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19850834

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AA0101179

19850835

2/3.

AA0101179
AUTHORS: Polyanskiy, A. F.; Kontorovich, B. M.; Koblik, L. M.;
Gusakov, V. I.; Tokarev, N. N.; Khlopin, A. N.; Borovik, S. A.

3/3

19850836

USSR   UDC: 533.652/.661.013

BOROVIK, V. N., VERESHCHAGIN, I. F., YAKOVLEV, V. I.

"Game Situations on a Sphere"

Translation: The authors consider game situations of pursuit on a sphere
of constant radius when a pursuing vehicle strives to approach the pursued
vehicle in the minimum time after detection. The process of the game is
limited by the fuel supply, atmosphere is disregarded, both vehicles
operate in the limit mode. Optimum trajectories and maneuvers are found
for approach of the vehicles in a given time, and a solution is found for
the problem where the pay-off is time of motion of the vehicles. Solution
of the principal equation of differential games shows that the thrust
vectors in the case of optimum control should be parallel to each other
(in the same direction in the case of an opposing target, and in opposite
directions in the case of a cooperating target), the direction of these
vectors depending on the relative range of the vehicles at the end of
the game. The optimum trajectories of both vehicles are arcs of a great
circle. G. S. Aronin.

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1/2   024   UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--AUTOCOLLIMATION METHOD FOR ADJUSTING AND MONITORING AN ANTENNA WITH
   VARIABLE PROFILE -U-
AUTHOR-(03)-KHODZHAMUKHAMMEDOV, N., STOTSKIY, A.A., BOROVIK, V.N.

COUNTRY OF INFO--USSR

SOURCE--RADIOTEKHNIKA I ELEKTRONIKA (RADIO AND ELECTRONICS), 1970, NO 2,
   PP 257-262
DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--ANTENNA CALIBRATION, COLLIMATION/(U)PULKOVO RADIOTELESCOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/1863   STEP NO--UR/0109/70/000/002/0257/0262

CIRC ACCESSION NO--AP0130690
                            UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0130690
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERED IS A NEW METHOD FOR
  ALIGNING AN ANTENNA OF VARIABLE PROFILE WITH A GROUND BASED SOURCE. THE
  EXPERIMENTAL VERIFICATION OF THE METHOD WAS MADE ON THE LARGE PULKOVO
  RADIOTELESCOPE.

UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--18SEP70

TITLE--SYNTHESIS OF SULFUR CONTAINING SPIROPYRIMIDINE BARBITURIC ACIDS -U-

AUTHOR-(02)-BOROVIK, V.P., MAMAYEV, V.P.

COUNTRY OF INFO--USSR

SOURCE--KHIM.-FARM. ZH. 1970, 4(1) 32-5

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--SULFUR COMPOUND, DRUG PRODUCTION, BARBITURATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1985/1644   STEP NO--UR/0450/70/004/001/0032/0035

CIRC ACCESSION NO--AP0101699

UNCLASSIFIED

CIRC ACCESSION NO--AP0101699

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TITLE SPIROBARBITURIC ACIDS ARE
PREPD. FROM BARBITURIC ACIDS OR N-SUBSTITUTED BARBITURIC ACIDS, UREA,
AND AN AROMATIC ALDEHYDE, FOR TESTS OF THEIR PHYSIOL. ACTIVITY. UREA
(3.6 G), 75 ML ACOH, 6.36 G BZH, AND 3.6 G 2,THIOBARBITURIC ACID HEATED
30 MIN AT 130DEGREES, GAVE 98PERCENT
SPIRO(2-OXO-4,6,DIPHENYLHEXAHYDROPYRIMIDINE-5, 5 PRIME-(2 PRIME,
THIOBARBITURIC ACID)), M. 225-7DEGREES (ACOH). ALSO PREPD. WERE
SPIRO-(2-THIOXO-4,6,DIPHENYLHEXAHYDROPYRIMIDINE 5,5 PRIME BARBITURIC
ACID), 76.5PERCENT, M. 245-7DEGREES (DMF-H SUB2 O);
SPIRO-(2-THIOXO-4,6,DIPHENYLHEXAHYDROPYRIMIDINE 5,5 PRIME (1 PRIME, 3
PRIME, DIMETHYLBARBITURIC ACID)), 98PERCENT, M. 243-4DEGREES (ACOH); AND
SPIRO-(2-THIOXO-4,6,DIPHENYLHEXAHYDROPYRIMIDINE 5,5 PRIME (2 PRIME,
THIOBARBITURIC ACID)), 96PERCENT, M. 214-17DEGREES (AQ. DMF). NMR AND
IR SPECTRAL DATA ARE GIVEN.

UNCLASSIFIED

1/2   015   UNCLASSIFIED   PROCESSING DATE--02OCT70
TITLE--ABSOLUTE CONDENSATION PUMP -U-

AUTHOR-(03)-BOROVIK, YE.S., GRISHIN, S.F., GRISHINA, YE.YA.

COUNTRY OF INFO--USSR

SOURCE--ZH. TEKH. FIZ. 1970, 40(3) 581-6

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--HIGH VACUUM PUMP, CRYOGENIC LIQUID COOLING, GAS LIQUEFACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/1929   STEP NO--UR/0057/70/040/003/0581/0586

CIRC ACCESSION NO--AP0108258
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0108258
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONSTRUCTION OF AN ABS.
  CONDENSATION PUMP IS DESCRIBED. BY USING SUCH PUMPS WITH A TEMP. OF THE
  CONDENSING SURFACE OF 0.24DEGREESK, IT IS POSSIBLE TO OBTAIN A VACUUM OF
  10 PRIME NEGATIVE12 WITH HE. FOR ACHIEVING LOWER VACUUMS, THE TEMP. OF
  THE SURFACE MUST BE DECREASED.

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USSR

UDC: 51:155.001.57:681.3.06

VORONIN, Yu. A., BOROVIKOV, A. M., SALIN, Yu. S., SOLOV'YEV, V. A., BUR-
KHANOV, Kh. Kh.

"On Computer Realization of Stratigraphic Constructions"

V sb. Mat. probl. geofiz. (Mathematical Problems of Geophysics--collection
of works), vyp. 2, Novosibirsk, 1971, pp 295-304 (from RZh-Kibernetika,
No 12, Dec 71, Abstract No 12V1027)

Translation: A procedure is given for computer realization of strati-
graphic constructions which briefly reduces to the following: 1) with
given classifications and enumerations of rocks and types, and a given
method of separating lithomatter and biomatter, columns q_k are separated
into one-dimensional lithobodies and biobodies, and a set of separated
columns (q_k) is obtained in part of the geological space G'; 2) a descrip-
tion of the (q_k) is given, specifically, a stratigraphic summary column
is constructed for G'; 3) on the basis of the resultant description of the
(q_k), a hypothesis is adopted on the method of identifying columns q_k and
a set of identified columns {q_k} in G' is obtained. The axioms and algo-
rithms for primary description of the set of columns are considered. Bibli-
ography of 17 titles. V. Mikheyev.
1/1

1/2   016   UNCLASSIFIED   PROCESSING DATE--27NOV70
TITLE--INVESTIGATION OF THE HIGH FREQUENCY ANTIFERROMAGNETIC RESONANCE
   BRANCH IN CSMNF SUB3 -U-

AUTHOR-(03)-BOROVIKROMANOV, A.S., KOTYUZHANSKIY, B.YA., PROZOROVA, L.A.

COUNTRY OF INFO--USSR

B

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
   NR 6, PP 1911-1918
DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CESIUM COMPOUND, MANGANESE COMPOUND, FLUORIDE, CRYSTAL
   SYMMETRY, ANTIFERROMAGNETIC MATERIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/2229   STEP NO--UR/0056/70/058/006/1911/1918

CIRC ACCESSION NO--AP0125807
                       UNCLASSIFIED

CIRC ACCESSION NO--AP0125807

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A HIGH FREQUENCY AFMR BRANCH IS
FOUND IN THE HEXAGONAL ANTIFERROMAGNETIC SUBSTANCE CSMNF SUB3 AND THE
GAP OF THE BRANCH IS DETERMINED. THE TEMPERATURE DEPENDENCE OF THE GAP
IS STUDIED AND IT IS SHOWN THAT AT HIGH TEMPERATURES TI CAN BE DESCRIBED
BY THE BRILLOUIN FUNCTION. THE DEPENDENCE OF THE AFMR LINE SHAPE ON
TEMPERATURE IS INVESTIGATED. THE AFMR SPECTRUM FOR CSMNF SUB3 IS
CALCULATED ON BASIS OF THE EXPRESSION FOR A THERMODYNAMIC POTENTIAL
SATISFYING THE CRYSTAL SYMMETRY.   FACILITY: INSTITUT
FIZICHESKIKH PROBLEM, AN SSSR.

UNCLASSIFIED

5

USSR

UDC: 669.15'782'743'295-196

ZHIRONKIN, A. N., BURKANOV, A. G., RAYNES, L. S., BOROVIKOV, A. A., SOKOLOV, V. L., PERSIDSKAYA, L. V., GABERTSETTEL', A. I., TOLOCHIN, V. G., TARAPATIN, P. S., Leningrad Kirov Plant

"Graphitized Steel"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 12, Apr 72, Author's Certificate No 334272, Division C, filed 15 Sep 69, published 30 Mar 72, p 104

Translation: This Author's Certificate introduces a graphitized steel which contains carbon, silicon, manganese, titanium and iron. As a distinguishing feature of the patent, friction properties are improved by adding copper and taking the components in the following proportions in percent: carbon--1.3-1.5; silicon--1.3-1.6; manganese--0.3-0.5; copper--1.2-1.6; titanium--0.25-0.4. Impurities are as follows (in percent): sulfur--less than 0.03; phosphorus--less than 0.035; chromium--0.20; nickel--less than 0.20; the remainder iron.

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USSR

UDC 541.62+543.422+546.18

KATOLICHENKO, V. I., YEGOROV, Yu. P., BOROVIKOV, Yu. Ya., and GOLIK, G. A.,
Institute of Organic Chemistry, Academy of Sciences UkrSSR

"Study of the Conformation of Alkylphosphonic and Phosphoric Acid Esters"

Abstract: In a study conducted on dialkyl alkylphosphonates and trialkyl phosphates, the conformation was determined on the basis of dipole moments and the ratio of conformation isomers on the basis of IR spectra. It was established that the simplest dialkyl alkylphosphonates were present in a liquid phase (solutions or melt) in the form of an equilibrium mixture of trans-gauche and gauche-gauche conformation isomers, while trialkyl phosphates were present in the form of a mixture of trans-trans-gauche and gauche-gauche-gauche isomers. The energy difference of the isomers in the equilibrium mixtures was less than 0.5 kcal/mole. In the case of esters with long alkyl chains, more than two conformation isomers were apparently present.

1/1

USSR

KOZLOV, E. S., GAYDAMAKA, S. N., BOROVIKOV, Yu. Ya., TSYBA, V. T., and KIRSANOV, A. V., Institute of Organic Chemistry, Ukrainian Academy of Sciences

"The Infrared Spectra ·and Nuclear Magnetic Resonance Spectra of P31, and the Dipole Moments of Bistrychloromethylchlorophosphazohydride and -chlorophosphazoalkanes"

Abstract: Recent studies of the synthesis of bistrychchloromethylchloro-phosphazo compounds $(CCl_3)_2ClP = NR$ (R = H, Alk) (I) have allowed us to observe the effect of bulky electrophilic substituents at the phosphorus atom -- and of electron donor substituents at the nitrogen atom -- on the character of the P = N bond; but information on the trichlorophosphazo-alkanes $(Cl_3P = N Alk)_2$ has not offered the same possibility.

To achieve this, the authors made experimental studies of trichloro-methylchlorophosphazo-β-chloroethane.

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USSR

KOZLOV, E. S., et al., Zhurnal Obshchey Khimii, Vol XL, No 12, Dec 70, pp 2549-2552

It was found that with increase in the PNC angle, there is a shift in the resonance of the phosphorus atom, and an increase in the dipole moment, and in the bond order of the $P = N$ bond.

2/2

USSR

BOROVIKOV, YU. YA., RYL'TSEV, YE. V., BOLDESKUL, I. YE., FESHCHENKO, N. G., MAKOVETSKIY, YU. P., YEGOROV, YU. P., Institute of Organic Chemistry, Kiev, Academy of Sciences Ukrainian SSR

"Dielkometric Study of Trialkylphosphine Derivatives"

Abstract: A study of the interaction between the molecules of trialkylphosphine oxides and their analogues in solutions by the method of dielectric permeability is reported. Trialkylphosphine oxides, trioctylphosphine sulfide, -selenide, -telluride and tetraalkylphosphine iodide were investigated. It was determined that the dipole moments and atomic polarizations of the trialkylphosphine oxides depend on the length of the hydrocarbon chain. The dipole moments of trioctylphosphine oxide, -sulfide, -selenide, and -telluride were identical within experimental error. Trioctylphosphine oxide and tetraoctylphosphine iodide are associated according to the antiparallel type in solvents of low dielectric

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permeability. The degree of association of trioctylphosphine oxide is higher in carbon tetrachloride than in benzene, and in chlorobenzene, trifluorobenzene, and acetone it is monomeric. The association of tetraoctylphosphine iodide persists even in solvents with high ε; their dipole moments are close to values corresponding to complete charge transfer from P to I.

USSR

UDC 621.311.25:621.039.526

KALAFATI, D. D., BOROVIKOVA, A. M.

"Binary Cycle with a Dissociating Working Medium in the Second Loop of Atomic Electric Power Plants with Fast Sodium Reactors"

Dissotsiiruyushch. gazy kak teplonositeli i rab. telo energ. ustanovok -- V sb. (Dissociating Gases as Heat Transfer Agents and the Working Medium of Power Plants -- Collection of Works), Minsk, Nauka i Tekhn. Press, 1970, pp 73-77 (from RZh-Elektrotekhnika i Energetika, No 5, May 1971, Abstract No 5U185)

Translation: The imperfection of turbine heat conversion systems at atomic electric power plants with fast reactors and liquid metal cooling $(Na-Na-H_2O)$ is noted. The scheme of an atomic electric power plant $(Na-Al_2Br_6 \rightleftarrows 2AlBr_3-H_2O)$ with a fast sodium reactor is proposed. Application of aluminum bromides in the binary cycle permits the efficiency of the atomic electric power plant to be improved by 4.8 relative percent and the dimensions of turbines operating on $Al_2Br_6 \rightleftarrows 2AlBr_3$ vapors to be decreased. Good compatibility of aluminum bromide with alkali metal is noted. There are 3 illustrations and a 6-entry bibliography

1/1

USSR

UDC 632.95

TROPIN, B. P., BEZUGLYY, S. F., BOROVIKOVA, L. N., GOLYSHIN, N. M., ZAIKIN, B. A., KRASNOVA, M. V., and MIKHULYA, S. A.

"Method to Decrease Evaporation of Pesticide Droplets"

USSR Author's Certificate No 33913, filed 13 Oct 69, published 6 May 72 (from Referativnyy Zhurnal -- Khimiya, Svodnyy Tom (I, L-S), No 1(II), 1973, Abstract No 1N467P by T. A. Belyayeva)

Translation: In order to decrease evaporation of pesticide droplets during aerial application (from airplane), 0.1-5% of antievaporating agent is added to pesticide. A mixture consisting of high-molecular weight synthetic aliphatic alcohol fractions $C_{10} - C_{16}$, $C_{10} - C_{18}$, $C_{10} - C_{20}$, nionionogenic surface-active substances (OP-4, OP-7, OP-10) and calcium dodecylbenzene-sulfonate can be used as antievaporating agent. Example. 85-93% primary aliphatic alcohols $C_{10} - C_{16}$ or $C_{10} - C_{18}$, 7-15% OP-7 or OP-10 are mixed to prepare the antievaporating agent (AE). One part of antievaporating agent is emulsified with 2-3 parts of water, the obtained emulsion is mixed with a suspensoid containing 8 parts of finely-dispersed wetting agent of copper oxychloride (90% strength), and water is added to make 100 parts. The emulsion-suspensoid prepared in this manner is used for aerial spraying of
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USSR

TROPIN, B. P., et al., USSR Author's Certificate No 333913, filed 13 Oct 63, published 6 May 72

plants in the amount of 50 liters/ha. The fungicide layer on plants in this case is usually more dense than without the addition of AE. Data are presented on preparation of spraying mixtures consisting of different fungicides and insecticides with AE, as well as evaporation rates of different size of droplets with AE-3P and AE-4P and without them, both under laboratory and field conditions (spraying of sugar beets).

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USSR

UDC 632.95

STONOV, L. D., ZHIRMUNSKAYA, N. M., TROFIN, V. P., GOLYADKINA, A. G., and
BOROVIKOVA, L. N.

"Herbicidal Activity of Atrazine and Simazine as a Function of the Physical
and Chemical Properties of the Preparations"

Vsb. Khim. Sredstva zashchity rast. (Chemical Agents for Plant Protection --
collection of works), vyp 1, Moscow, 1970, pp 201-209 (from RZh-Khimiya,
No 11, Jun 72, Abstract No 11N569)

Translation: When the moisture content of the soil is fairly high, the
degree of dispersion of particles of atrazine and simazine had no effect on
their herbicidal activity. Changes in the concentration of auxiliary material
OP-7 and sulfite-alcohol residues from 3 to 25% and also the sorption capacity
had no effect on the herbicidal activity of the chemicals. The best wett-
ability for powdered preparations of atrazine and simazine and the optimum
stability of aqueous suspensions were observed when the specific surface
was 15,000-20,000 sq. cm per gram.

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BOROVIKOVA, R.P.

semiconductor/electronics

METHODS OF INVESTIGATING THE THERMOELECTRIC PROPERTIES OF SEMICONDUCTORS

CONTENTS

PAGE

[I - USSR - E]

1/2   023   UNCLASSIFIED   PROCESSING DATE--18SEP70
TITLE--EFFECT OF A BISMUTH TELLURIDE IMPURITY ON THE BAND STRUCTURE OF TIN
  TELLURIDE -U-

AUTHOR-(05)-BOROVIKOVA, R.P., DUDKIN, L.D., YERASOVA, N.A., KAZANSKAYA,
  O.A., KAYDANOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1) 231

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--BISMUTH, ELECTRICAL CONDUCTIVITY, TIN COMPOUND, TELLURIUM
  COMPOUND, ACTIVATION ENERGY, ENERGY BAND STRUCTURE, HALL CONSTANT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/0578   STEP NO--UR/0449/70/004/001/0231/0231

CIRC ACCESSION NO--AP0105561
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0105561

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TEMP. DEPENDENCE OF ELEC. COND.; THERMAL EMF., THE HALL CONST., AND THE TRANSERSE NERNST ETTINGSHAUSEN EFFECT WAS STUDIED EXPTL. IN SN SUB1 NEGATIVEX BI SUBX TE (0 SMALLER THAN OR EQUAL TO TIMES SMALLER THAN OR EQUAL TO 0.1) SOLID SOLNS. AT 80-500DEGREES K. IN COMPARISON TO PURE SNTE, A DECREASE IN HALL MOBILITY IS NOTICED AND A MAX. APPEARS ON THE TEMP. DEPENDENCE CURVE OF THE HALL CONST. THERE ARE 2 POSSIBLE EXPLANATIONS FOR THESE AND OTHER OBSD. CHANGES: (1) THE ADDN. OF BITE LOWERS THE ENERGY GAP BETWEEN REGIONS OF LIGHT AND HEAVY HOLES; (2) IMPURITY (DONOR) LEVELS OF BI SPLIT INTO AN IMPURITY BAND LOCATED BELOW THE VALENCE BAND. IN BOTH CASES, THE ADDN. OF BI HAS LITTLE INFLUENCE ON THE CONCN. OF HOLES.

UNCLASSIFIED

USSR

UDC 669.71.042.6

DANILKIN, V. A., ESKIN, G. I., BOROVIKOVA, S. I.

"Study of the Process of Formation of the Ingot Structure of Aluminum and Its Alloys under the Effect of Ultrasonic Treatment in the Crystallization Process"

Translation: The quantitative relation between the ultrasonic treatment parameters, the chemical composition of the aluminum, and the intensity of development of cavitation in the melt with refinement of the aluminum grain size was studied more precisely to define the ultrasonic treatment parameters to obtain fine grained structure in aluminum alloys under laboratory conditions and on an experimental industrial unit. The optimal conditions of ultrasonic treatment of aluminum and its binary alloys with Zn, Mn, Zr, and Si are defined.

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USSR

UDC 669.715:66.065.51:621.9.048.6

ESKIN, G. I., DANILKIN, V. A., SHVETSOV, P. N., and BOROVIKOVA, S. I., All-Union Institute of Light Alloys

"Influence of Ultrasonic Treatment on the Crystallization Process of Aluminum and Its Alloys"

V sb. Modifitsir. siluminov (Modification of Silumins — Collection of Works), Kiev, 1970, pp 148-157 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 1742 by O. PIMENOVA)

Translation: Results are presented of experiments involving ultrasonic treatment of crystallized ingots of aluminum and alloys (Al-Mn, Al-Mg, Al-Cu-Mn-Zr, Al-Cu-Mn-Mg-Si, etc.) during continuous casting in a water-cooled crystallizer. The authors determined the shrinkage, hydrogen content, structure, chemical composition, and mechanical properties of the ingots. With ultrasonic treatment, uniform size reduction of macrograin over the entire ingot cross section can be obtained. The effectiveness of modifying additives (Ti, Zr, etc.) rises, and the hydrogen content of ingots declines 2-3 times. Apart from a 10 to 15% increase in strength and plasticity characteristics, ultrasonic treatment makes it possible to equalize properties over the cross section, which is of the greatest practical importance. Seven illustrations. One table. Bibliography of 13 titles.
1/1

USSR

BAKHRAKH, Ye. E., BOROVIKOVA, T. P., VEYNBLAT, V. I., DAL'VADYANTS, S. M., and
TARENENKO, T. M., All-Union "Mikrob" Plague Research Institute

"Characteristics of Somatic Antigens of Pasteurella pestis"

Abstract: Chemical analysis of the main somatic antigen of Pasteurella pestis
showed that it does not contain lipid A or the sugars characteristic of the
central polysaccharide-aldoheptose and ketodesoxyoctanate. The monosaccharides
present include galactose, glucose, glucosamine, mannose, and rhamnose.
Fractionation of the main somatic antigen on Sephadex G-75 results in 2 com-
ponents. One consists mostly of protein and a small quantity of nucleic acids
and a polysaccharide. The other contains not only proteins but all the sugars
present in the original antigen. The polysaccharide-containing haptene is
regarded as the lateral O-specific chain of a liposaccharide.

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USSR   UDC 615:373.3:576.851.45].011.5

TARANENKO, T. M., BAKHRAKH, Ye. E., ANDREYEVA, I. P., and BOROVIKOVA, T. P.,
"All Union Scientific Research Antiplague Institute, "Mikrob", Saratov

"Significane of Certain Functional Groups in the Biological Activity of Pestin
PP"

Abstract: It is generally believed that the activity of allergens used for
various diagnostic tests is associated with alpha-amino groups and with the
phenol groups of cyclic amino acids. This study was performed to investigate
the role of free amino groups and cyclic amino acids in the allergenic proper-
ties of pestin PP -- a preparation recommended for detecting immuno-allergic
shifts in patients with plague. Formalinization, acetylation, and iodination
of pestin PP obtained from plague vaccine strain EV considerably reduced the
allergenic activity of the preparation, while deamination completely abolished
this activity. These results indicate that the allergenic activity of pestin
PP is associated with both free amino groups and phenol groups in aromatic
amino acids.
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1/2   011   UNCLASSIFIED   PROCESSING DATE--27NOV70
TITLE--TANTALUM MONONITRIDE PREPARATION -U-

AUTHOR-(05)-MERZHANOV, A.G., BUTAKOV, A.A., SHEKHTMAN, V.SH.,
BOROVINSKAYA, I.P., RABINKIN, A.G.
COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 264,365
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI, 1970
DATE PUBLISHED--03MAR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--TANTALUM COMPOUND, CHEMICAL PATENT, NITRIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/1444   STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0126975
                              UNCLASSIFIED

CIRC ACCESSION NO--AA0126975
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CUBICALLY MODIFIED TA MONONITRIDE
  IS PREPD. BY HEATING TA IN N.   FACILITY: FILIAL INSTITUTA
KHIMICHESKOY FIZIKI AN SSSR.

UNCLASSIFIED

BOROVINSKIY, L.A.

SIPRS 59268
6-73

SESSION IV

IV-1. A POSSIBLE MECHANISM OF TRANSFER OF THE EPITAXIAL EFFECT THROUGH THE
INTERMEDIATE AMORPHOUS LAYERS

[Article by L. A. Borovinskiy, Novgorod; Novosibirsk, III Simpozium po Protsessam
Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June, 1972,
p 42]

G. I. Distler and his co-workers detected the oriented deposition of
crystal substances (for example, anthraquinone or an amorphous or polycrystalline
layer to 1500-2000 Å thick applied to the monocrystalline substrate. One of the
possible explanations of this effect consists in the following. The microsteps
on the substrate surface or other linear defects can carry a linear charge sur-
rounded by a shielding space charge of opposite sign. The fields of these charges
on the surface of an amorphous layer cause transmission of nucleating centers of
the deposited substance. If the molecules of this substance are nonpolar but
they have an anisotropic polarity, the part of their energy which depends on
the orientation in the field with a longitudinal component $E_{||}$ has the form:

$$U'' = -\frac{1}{2} E_z^2 (\alpha_{xx} - \alpha_n) \cos^2\beta$$

where α_{xx}, α_{yy} are the components of the polarity tensor along the molecular
axes parallel to the surface, β is the angle between the x axis of the molecule
or the nucleating center) and the tangential component of the field. The calcu-
lation of the mean angle of deviation of this axis of the nucleating center from
the tangential component of the field gives the following orientation criterion
for the nucleus:

$$\frac{W}{kT} = \frac{E_z^2 (\alpha_{xx} - \alpha_n)}{2\Delta\mu} \gg 1$$

where W is the work of the formation of the nucleating center, and $\Delta\mu_0$ is the
difference in chemical potentials of the adsorption layer and the deposited
substance without considering the contribution of the oriented field. On the
basis of this criterion it is also possible qualitatively to explain the
orientation in the stage of growth and coalescence in the case of the occurrence
of initially unoriented nucleating centers.

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AA0053084‾ BOROVITSKIY V.I.
UR 0482

Soviet Inventions Illustrated, Section III Mechanical and General,
Derwent, S-70

244004   CONSTANT PRESSURE REGULATOR. The con-
trol of constant oil pressure in the
forced lubrication system of an interal combustion
engine is achieved by coupling the thermostat 2 in
feed pipe 1 through rod 3 to box valve unit 6 and
coupling the shaft of the valve 9 to the metering
rod 12 of the oil supply pump 13. Thus the pres-
sure in pipe 5 regulates the output of the pump
to feed pipe 1 and controls the pressure to pipe
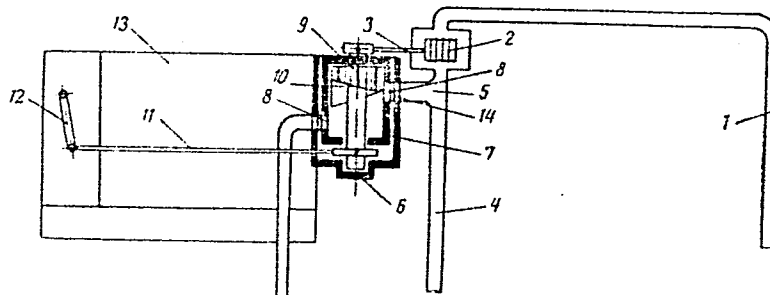4 and to the crankshaft bearings.
15.2.68 as 1218062/24-6 O.B. LEONOV et al. N.E.
Bayman, Moscow, Technical College (3.10.69) Bul.
17/14.5.69. Class 46c, Int. Cl. F O1m.

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19821982

AA0053084

Leonov, O.B.; Borovitskiy, V.I.; Arapov, V.V.; Manuylov, N.N.;
Patrakhal'tsev, N.N.; Soldatov, N.K.; Moskovskoye Vyssheye
Tekhnicheskoye Uchilishche im. N.E. Baumana

19821983

USSR

BOROVKOV, A. A.

"Conditions of Convergence to Degenerate Processes"

Moscow, Teoriya Veroyatnostey i yeye Primeneniya, Vol 18, No 3, Jul-Sep 73, pp 449-456

Abstract: Given that $\{Z(u), 0 \le u \le U\}$ is an arbitrary separable process given in some space $R(0,U)$ of real-valued functions on $[0,U]$ with a σ algebra $\mathcal{R}^U$, containing cylindrical sets on $[0,U]$, the article examines a sequence of such processes $Z_{T(u)}$, dependent on the parameter T increasing without limit and given on an extending time interval $U=vT$, where $v > 0$ and is fixed. The problem is to determine the conditions of convergence of the sequence of processes to some determinant process in the uniform metric on $[0,v]$. This corresponds to the convergence of distributed measurable functionals continuous in the uniform metric to a distribution concentrated at one point. As might be expected, the conditions of such convergence are significantly simpler than the conditions of convergence to nondegenerate processes.
    An example of the application of the results is two ergodic theorems for multichannel, loaded queueing systems.
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$\delta = \delta(x, \varepsilon, \beta)$ are found such that

$$|f(x) - f(w)| < \varepsilon,$$

only if

$$y \in V_{N,-\beta}, \quad \max_{j < N} |x_j - y_j| < \delta.$$

Now let the random sequence $\xi = (\xi_1, \xi_2, \ldots)$ and the sequence

$$\xi^{(n)} = (\xi_1^{(n)}, \xi_2^{(n)}, \ldots),$$

given, in the general case, in different probability spaces, be given.

Theorem 1. For any V-continuous functional f, the distribution $f(\xi^{(n)})$ converges weakly at $n \to \infty$ to the natural distribution $f(\xi)$ when and only when the following conditions are satisfied:

1. The finite-dimensional distributions $\xi^{(n)}$ reduce to the finite-dimensional distributions ξ; $P(\xi \in V) = 1$.

2. $\lim_{N \to \infty} \overline{\lim_{n \to \infty}} P(\xi^{(n)} \in V_{N,\beta}) = 0$.

Sufficient conditions of convergence are obtained for the most important special cases.

Let, for example, $\xi_k^{(n)} \sum_{j=1}^{k} \eta_j^{(n)}$, $\xi_k = \sum_{j=1}^{k} \eta_j$, where $\eta_1^{(n)}, \eta_2^{(n)}, \ldots)$ and

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USSR

UDC 519.2

BOROVKOV, A. A.

"Course in Probability Theory. Textbook for Students of Mathematics and Physics of the Specialized Institutions of Higher Learning"

Kurs teorii veroyatnostey. Ucheb. posobiye dlya stud. mat. i fiz. spets. vuzov. (cf. English above), Moscow, Nauka, 1972, 238 pp, ill., 65 k. (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V86 K)

Translation: The content of the first seven chapters is reflected quite completely in the title of the chapters; therefore, it is simple to list these titles, sometimes reporting certain peculiarities of the arrangement or the discussion of the material. Chapter 1. "Discrete Space of Elementary Outcomes." Chapter 2. "Arbitrary Space of Elementary Outcomes." Chapter 3. "Random Variables and Distribution Functions"has sections in which the properties of independence of the classes of events are discussed. Chapter 4. "Numerical Characteristics of Random Variables" includes a section devoted to the provisional probability of an event and the provisional mathematical expectation of a random variable with respect to another random variable. Chapter 5. "Sequence of Independent Tests with Two Outcomes" contains the Bernoulli theorem, the local and integral Moivre-Laplace theorem, the Poisson theorem and more precise definitions of them. Chapter 6. "Characteristic Functions." Chapter 1/2

USSR

UDC: 519.2

BOROVKOV, A. A.

"Probability Processes Queuing Theory"

Moscow, "Nauka," 1972, 368 pp, illustrated (from RZh--Matematika,
No 6, 1972, Abstract No 6V42K)

Translation: This monograph investigates special forms of random
processes connected with the description of mass service systems
under any general assumptions concerning their functioning. A
great deal of attention is given to the proof of ergodic theorems,
methods of computing the distributions of various system charac-
teristics, estimates of the rate of convergence to a stationary
distribution, and the limited behavior of system characteristics
for large and small loads. Systems of mass servicing are described
in terms of controlling sequences. The monograph contains an in-
troduction, eight chapters, and four appendices. It also contains
bibliographical notes which briefly discuss works on subjects men-
tioned by the author. The introduction presents a classification
of the systems considered and of controlling algorithms encountered
in the subsequent exposition. The first chapter considers a single-
channel system of mass servicing in which the order, for which the
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USSR

BOROVKOV, A. A., Nauka 1972, 368 pp (from RZh--Matematika, No 6, 1972, Abstract No 6V42K)

controlling algorithm is set up, is such that the call next in line is serviced directly after the end of the preceding servicing and at the onset of even one call if the system is free. Ergodic theorems are obtained for the processes investigated under conditions that are almost necessary, and the limiting and pre-limiting distributions of the processes are considered for large and small loads. Estimates are given for the convergence rate of the distributions for expectation time and the virtual expectation time to the stationary state. For the case in which the control-ling sequences are independent and stationary, the study of single-channel systems reduces to the limiting conditions for random er-rors describable by processes with independent increments or se-quences with independent increments. Chapter 2 considers processes with independent increments continuous from below; chapters 3 and 4 consider sequences with independent increments. In chapters 5 and 6, ordered multichannel systems are analyzed, with the case of a finite number of devices examined in chapter 5 and the case of an

2/3

USSR

BOROVKOV, A. A., Nauka, 1972, 368 pp (from RZh--Matematika, No 6, 1972,
Abstract No 6V42K)

infinite number of devices examined in chapter 6. Chapter 7 in-
vestigates multichannel systems with a finite number of channels
and the occurrence of breakdowns. Chapter 8 considers systems with
autonomous servicing. As in chapter 1, the basic theme of chapters
5 to 8 is the problem of the existence of stationary distributions
and the method of their computation, estimation of the rate of con-
vergence to a stationary distribution, and problems of the asymp-
totic behavior of the systems. The appendices are in four sections.
The first considers problems in the theory of restoration. The
second analyzes problems in the factorization of ring elements of
Fourier-Stieltjes transformations of functions of limited variation.
Appendix 3 discusses the asymptotic behavior of the coefficients
of functions in the form of absolutely convergent series. Prob-
lems in the theory of large deviations for the sums of independent
terms are considered in Appendix 4. V. Shpak

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USSR

UDC: 519.2

BOROVKOV, A. A.

"Probabilistic Processes in Queuing Theory"

Vercyatnostnyye protsessy v teorii massovogo obsluzhivaniya (cf. English above), "Nauka", 1972, 368 pp, ill. 1 r. 44 k. (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V42 K)

Translation: This monograph investigates special types of random processes involved in the description of queuing systems, using general assumptions on the nature of their functioning. Principal attention is given to proving ergodic theorems, methods of calculating the distributions of various characteristics of the systems, estimates of the rate of convergence to a steady-state distribution, and the limiting behavior of the characteristics of systems under heavy and light loading. Queuing systems are described in terms of controlling sequences. The monograph contains an introduction, eight chapters and four appendices. In addition, it contains bibliographic notes in which related works on points raised by the author are briefly discussed. In the introduction, the given systems and controlling algorithms encountered in the subsequent exposition are classified. The first chapter investigates a single-channel queuing system with a queue for which

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USSR

BOROVKOV, A. A., Veroyatnostnyye protsessy v teorii massovogo obsluzhi-
vaniya, "Nauka", 1972

a controlling algorithm is constructed in such a way that service to the
next batch of customers begins immediately after completion of service to
the preceding batch, as well as upon the arrival of at least one customer
if the system is free. Ergodic theorems are derived for the investigated
processes under conditions close to necessary conditions, and limiting and
sublimiting distributions of the investigated processes are considered for
heavy and light loading. Estimates are presented for the rates of con-
vergence of the distributions of waiting time and the virtual waiting time
to steady-state distribution. In the case where the controlling sequences
are independent and stationary, the investigation of single-channel systems
reduces to boundary-value problems for random walks described by processes
with independent increments or by sequences with independent increments.
Chapter 2 deals with processes with independent increments continuous from
below, while chapters 3 and 4 deal with sequences with independent incre-
ments. Multichannel systems with a queue are investigated in chapters 5
and 6: chapter 5 is concerned with the case of a finite number of servers,
while the case of an infinite number of servers is taken up in chapter 6.
Multichannel systems with a finite number of channels in the presence of

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- 2 -

USSR

BOROVKOV, A. A., _Veroyatnostnyye protsessy v teorii massovogo obsluzhi-vaniya_, "Nauka", 1972

breakdowns are investigated in chapter 7. Self-service systems are con-sidered in chapter 8. In both chapter 1 and chapters 5-8, the principal subject matter is problems of the existence of steady-state distributions and methods of calculating them, and estimates of the rates of convergence to a steady-state distribution, as well as problems of asymptotic behavior of systems. The appendix is made up of four divisions. The first deals with problems of recovery theory. The second examines problems of factor-izing elements of a ring of Fourier-Stieltjes transforms on functions of limited variation. Appendix 3 is devoted to the asymptotic behavior of the coefficients of functions represented as absolutely convergent series. Problems of the theory of large deviations for the sums of independent terms are taken up in appendix 4. V. Shpak.

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USSR

The first theorem and its proof are largely the result of considerations used by R. M. LOYNES in his study of ergodic theorems for queueing systems. The second theorem has an important role in studying the convergence of distributions of functionals of a sequence of stochastic processes given on an entire axis, and has also arisen in connection with queueing theory problems during a discussion with P. FRANKEN and YE. PECHERSKIY of stability theorems in ergodic theorems.

2/2

USSR   UDC 519.2

BOROVKOV, A. A.

"Convergence of Distributions of Functionals of Stochastic Processes"

Moscow, Uspekhi Matematicheskikh Nauk, Vol 27, No 1, Jan-Feb 72, pp 3-41

Abstract: The article begins with a review of the current status of studies involving general questions of the convergence of stochastic processes. There are two main directions, the first involving the study of the weak convergence of measures in metric or arbitrary topological spaces, the second involving the construction of an "equivalent" (in distribution) sequence of processes already given in one probability space. The author then suggests a different, more elementary and simpler approach to the study of the convergence of distributions of functionals of stochastic processes, involving approximation of the paths of a process by functions from some family. Approximation in the sense of proximity of the functionals considered is meant here. This approach is used to formulate theorems on the so-called ρ_C and ρ_D convergence of distributions of processes. Theorems on the ρ_C and

1/2

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BOROVKOV, A. A., Uspekhi Matematicheskikh Nauk, Vol 27, No 1, Jan-Feb 72, pp 3-41

ρ_F convergence of distributions of processes are considered, as well as a theorem on the ρ_{L_λ} convergence of distributions of processes. A continuation of the article will deal with limit theorems for functionals of processes given on an entire axis.

2/2

Probability & Statistics

USSR

UDC 519.21

BOROVKOV, A. A., Corresponding Member of the Academy of Sciences USSR, Institute of Mathematics of the Siberian Department of the Academy of Sciences USSR, Novosibirsk

"Ergodic Theorems for Multi-Channel Queueing Systems"

Moscow, Doklady Akademii Nauk SSSR, Vol 194, No 4, 1 Oct 70, pp 743-746

Abstract: Five existence theorems are proved concerning the stationary limiting distribution for the sequence $\{q_{n+k}(x); k \geq 0, x \geq 0\}$ as $n \to \infty$. It is said that an m-channel queueing system with requests is controlled by a sequence of pairs of random quantities

$$\{\tau_j{}^e, \tau_j{}^s; j \geq \omega\}$$

if the requests come to the system at times 0, $\tau_1{}^e$, $\tau_1{}^e + \tau_2{}^e,\ldots$ and the time $\tau_j{}^s$ is expended on servicing the j-th request if such exists. If an incoming request leaves all m channels occupied, it receives a refusal and is out of consideration. If the number q_n of occupied channels at the time before the arrival of the n-th request is less than m, the request is taken for servicing by one of the free channels. Thus, q is always $\leq$ m for these systems. It is
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USSR

assumed that $q_1 = 0$. It is assumed that the controlling sequence is strictly stationary; it is then assumed that a stationary sequence "infinite in both directions" is defined on the basic probability space

$$\left\{ \tau_j^e, \tau_j^s; -\infty < j < \infty \right\} \qquad (1)$$

and that control of the system is a consequence of this sequence. It is stated as a generalization that the sequence (1) need not be entirely stationary for the existence of the limiting distribution $q_{n+k}(x)$. It is sufficient only that the sequences $\left\{ \tau^e j, \tau^s j; j \geq 0 \right\}$ converge to a stationary sequence in some sense as $n \to \infty$.

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